Interesting to zoologists, is the research work as to the possibility that these nontuberculous pulmonary calcifications might be connected with *Ascaris* larvae passing through the lungs. It was concluded that the epidemiological study did not prove or disprove the possible rôle of *Ascaris*.

In talking with Dr. Emmons, he took a conservative view as to definitely incriminating *Histoplasma capsulatum*, notwithstanding the frequency of positive histoplasmin reactions, as contrasted with coccidioidin ones.

Following World War I there were many cases of infection with *Coccidioides immitis* reported from California, and the burden of evidence indicated a fatal termination.

As noted in this war manual it is now recognized that there are types of coccidiomycosis which are relatively benign, with cases reported from Texas, Arizona and New Mexico. In Arizona from 75 to 97 per cent. of Indian children reacted positively to coccidioidin. Positive coccidioidin tests were essentially negative among the nurses except for nurses who had lived in California or southwestern parts of the United States.

Histoplasmosis too had been formerly considered as a fatal infection.

I heartily recommend this timely and authoritative war manual to clinical pathologists.

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DAIRY CATTLE BREEDING

Heredity in Dairy Cattle. By JAMES E. RUSSELL. 135 pp. Illustrated. The American Guernsey Cattle Club, Peterborough, New Hampshire. 1944. $2.50.

THIS book by James E. Russell, formerly dean of Teachers College, Columbia University, and for many years a breeder of Guernsey cattle, is intended as a guide and inspiration for the successful business man and young person considering the breeding of cattle either as a vocation or avocation. It is not, as its title might imply, a scientific treatise on inheritance in cattle.

In his preface the author pays tribute to the scientific workers who have discovered the underlying principles of inheritance, but says that Part I is to treat of the "few important biological principles which have a direct bearing on the breeding of dairy cattle . . . and not to be greatly concerned with the methods of scientific procedure or the successive stages by which reliability of findings has been established . . . we stress the action of genes rather than the behavior of chromosomes . . . and will avoid concise technical terms like gamete, heterozygote, etc." Part II is to be the story of some successful breeders and a cattle family. Part III, personal experiences.

Part I, Theory of Genetics, while generally in keeping with present knowledge of inheritance, contains many loose and ambiguous statements of which the following are examples:

> In effect, only *one-fourth of the possible combinations of chromosomes* in the two original sex cells which unite in the fertilization of an egg cell do appear in the resulting new individual. . . .
>
> The necessity of getting rid of half the chromosomes in maturing sex cells in order that the standard number of the species be restored at the time of conception raises questions of special interest to breeders. Is it merely a matter of chance that decides what each offspring of a particular pair gets? *May it happen that one member of a family gets more from one parent than do brothers or sisters? Or, in an extreme case, may one offspring get its inheritance solely or largely from one parent and little or nothing from the others?* . . .
>
> We know now that nothing except external physical injury can disturb the normal development of an unborn child. . . .
>
> In animal breeding there is no escape from the necessity of dealing with a "mixed lot." However, Mendel pointed out that each character operates as a unit and that whenever two are opposed, one becomes dominant and the other recessive while biding its chance to appear again.

The author's attempt to popularize the genetics of cattle is on the whole not too successful, although he has made it interesting and woven a lot of his own philosophy of life into it. The halving and sampling nature of the hereditary process, for example, is nowhere made clear.

Part II deals with the art of breeding and for illustrative material the author discusses a successful small herd, a large commercial herd, his own herd and the Mixter Faithful strain of Guernseys.

The small herd and farm is that owned by Vernon D. Mudgett at Sterling Junction, Massachusetts. Mr. Russell has woven an interesting and inspiring story of Mr. Mudgett's accomplishments. Taking over an old somewhat run-down farm when just out of college, Mr. Mudgett, with a cash start of only $1,000, has developed a very profitable farm business and one of the best small Guernsey herds in the East. By hard work; careful planning; being ever ready to learn and to try out new methods; by making old things do until cash was available to provide the new; and last but far from least, by choosing the proper sort of girl for his wife and helpmate Mr. Mudgett has, relatively early in life, established himself as one of the leading farmers and breeders in his state.

Mr. Russell correctly stresses the advantages of diversification for the small farmer using Mr. Mudgett's experiences with poultry, fruit, milk and

breeding stock to drive his point home. The best part of the story from this reviewer's standpoint, is that relating to Mr. Mudgett's progress in breeding a splendid herd of Guernseys from 3 or 4 well-chosen foundation cows coupled with his carefully studied plan of choosing sires. In the latter is exemplified the wisdom of choosing sons of proved sires out of daughters of proved sires—said daughters also being members of good cow families. The breeding story would have been more easily followed had Mr. Russell made a family chart of the whole herd rather than using narrative and tables and had he included some pedigrees.

The large commercial dairy herd discussed is the Overbrook herd in Essex County, New Jersey. Management of this Holstein herd was assumed by Mark H. Keeney in 1923. This astute manager and breeder set as his goal a large herd that would average over 500 pounds of butterfat per cow per year and not only reached his goal but has held it over 10 years. In a herd numbering 70 to 80 cows this is a truly remarkable accomplishment. Mr. Keeney, in his own book, "Cowphilosophy," has told the story in detail. Mr. Russell in his discussion dwells largely on Mr. Keeney's choice of sires which follows the pattern already described in the small Guernsey herd of Mr. Mudgett.

In writing about his own herd, Mr. Russell says, "Four or five generations on bovine history—weaken the memory," and, of course, he might very well have added, "also the genetic influence." Mr. Russell has apparently done a splendid job of breeding Guernseys, but his telling about it would have been more clear had he used a herd chart and included some pedigrees. When several hours of work had put Mr. Russell's words into the form of a herd chart and we had traced several pedigrees, we learn that his foundation cow made 654 pounds of butterfat; 3 daughters averaged 675 pounds; 10 granddaughters averaged 697 pounds; 17 great granddaughters averaged 704 pounds and 5 great, great granddaughters 717 pounds. This is a great cow family.

Also from the chart, we can see that the first bull's daughters averaged 633 pounds of fat; the second bull's 9 daughters—688 pounds; the third, 8 daughters—689 pounds; the fourth, 4 daughters—730 pounds; the fifth, 3 daughters—737 pounds; the sixth, 4 daughters—756 pounds; the eighth, 2 daughters—681 pounds.

These are selected advanced registry records of the cows in this cow family. What all the daughters of this succession of bulls averaged and how the daughters' average compared with that of their dams, we do not know. To make progress in breeding we need all the facts—not the few selected best ones.

The chart of this cow family also reveals that there are great differences among the different lines within the family.

Part II concludes with a discussion of the Mixter Faithful strain of Guernseys and again the lack of pedigrees makes the material hard to visualize and retain.

Part III, a short essay titled "Personal Experiences and Suggestions," is utilized by Mr. Russell to sum up Parts I and II for those who may be thinking of embarking on a cattle breeding enterprise and to philosophize on farming and breeding both as a way of life and of making a living.

In this last section, as indeed throughout the book, the author seeks to warn the unwary of the seemingly devious ways of nature in failing to live up to the old adage that "like begets like" but he does not attempt an elucidation of the genetic and environmental causes of variation.

In the writer's opinion the book should be stimulating to animal lovers of all ages. His main criticisms are (1) that the author is inclined to play a little fast and loose with the science of genetics for the sake of popularization, thereby failing to make genetic principles stand out as clearly as they might have been made to do; and (2) that, since the author knew Guernsey history and pedigrees so thoroughly himself, he did not deem it wise to use more pedigrees and family charts relying alternatively on narrative and thus making reading and retention more difficult for the average reader.

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